Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

future communication, to offer to the American Academy some results of permanent value obtained by means of the instruments which could not have been supplied but through its generous aid. Only the intense application required for the zone-observations delays at present those upon the physical character of the stars whose positions we are determining.

With great respect, I am, dear sir,
Your obedient servant,
B. A. Gould.

The Treasurer stated that he had received $573, (the value in currency of $500 in gold,) returned by Dr. Gould to the Academy for reasons fully explained in his letter.

Professor J. M. Crafts described a series of tests recently made at the Institute of Technology, on the solubility of sulphide of arsenic in free chlorohydric acid, and on the fire-proof qualities of a concrete.

Professor Wolcott Gibbs announced that he had found that the higher alkaloids, strychnin, brucin, etc., form, with the phosphates and arsenates of uranium and of the metals of the magnesian group, well-defined salts corresponding to the well-known ammonio-magnesic phosphate and arsenate. Many of these salts yield splendid crystals, which promise to extend our power of separating the different alkaloids from each other. The uranic salts are remarkably insoluble, and will probably yield quantitative methods of analysis.

Dr. J. B. S. Jackson exhibited two photographs of the presumed fossil human skeleton lately exhumed at Mentone. He also exhibited a specimen of a urinary calculus, cut in two and polished to show its internal structure.

Six hundred and fifty-third Meeting.

January 29, 1873. — Stated Meeting.

The President in the chair.

The Corresponding Secretary stated that the list of Resident Fellows exceeded in number that allowed by the charter, and that, consequently, further elections could not be held at present.

The President announced the loss the Academy had sustained in the deaths of Professor Adam Sedgwick and Mr. W. J. M. Rankine, Foreign Honorary Members.

He also announced that he declined to be a candidate for re-election at the approaching Annual Meeting of the Academy.

Professor J. P. Cooke proposed an amendment of the statutes of the Academy relating to the election of Fellows. This proposition was referred to a committee consisting of Messrs. C. F. Adams, G. T. Bigelow, and J. P. Cooke.

Mr. Edmund Quincy proposed the insertion of a clause in the statutes relating to the removal of names from the list of members for non-payment of fees. His proposition was referred to the same committee.

Mr. S. P. Sharples read a paper on some methods of disposing of slaughter-house refuse.

Professor Joseph Lovering communicated the results of the computations made, under his direction, for the determination of the difference of longitude between Cambridge and Duxbury, Massachusetts, by means of telegraphic signals, and also for the determination of the difference of transatlantic longitude between Duxbury and Brest, France, by means of telegraphic signals exchanged through the French cable-line. He stated that three campaigns had already been conducted by the officers of the United States Coast Survey for the settlement of transatlantic longitudes. 1. The first was in the autumn of 1866, when the signals were sent through the English cable-line. 2. The second was in the winter of 1869–70. 3. The third was in the summer of 1872. In the second and third operations, the French cable-line was used. The communication of Professor Lovering related especially to the second of these campaigns, and was made by permission of Professor Benjamin Peirce, the Superintendent of the United States Coast Survey. A full account of the method of exchanging signals and the forms of computation will appear in Volume IX. of the Memoirs of the Academy. The final result, corrected for Personal Equation, is: —

Difference of longitude between Cambridge and Duxbury	$1^{m}\ 50^{s}.205 \pm .022$
Difference of longitude between Duxbury and Brest	$4^{h}\ 24^{m}\ 43^{s}.277 \pm .047$
Difference of longitude between Cambridge and Brest	$4^{h}\ 26^{m}\ 33^{s}.482 \pm .052$

Professor J. P. Cooke described a method he is employing for the manipulation of hydric sulphide.

The manipulation of hydric sulphide in a large laboratory has always been a difficult problem, and the inconveniences arising from the use of this reagent, in the state of gas, are so great, that, when a class of forty or fifty students are working with it at once, the nuisance becomes almost unbearable. When dissolved in water, however, this reagent gives as little trouble or annoyance as any other; but, as ordinarily prepared, the solution is so weak that the substance under examination is deluged with water before the required excess of the reagent has been added. This objection can be wholly overcome by dissolving the gas under pressure, and drawing off the solution from a siphon like soda-water, and, in any laboratory where water is supplied under pressure, such a supersaturated solution can be very readily prepared with a very simple apparatus, which may be mounted in the following manner.

We use for the purpose the common green glass bottles in which acids are usually sold by the druggists, only taking care to select strong bottles with a well-rounded neck about one and a quarter inches in diameter. Let us designate by A, B, and C three two-quart bottles of this description, and by D a similar but larger bottle, having a capacity of two gallons. In A, the gas is generated from ferrous sulphide, water, and sulphuric acid, in the ordinary way. We pass the gas from A, first through a wash bottle filled with moistened sponge, and through the distilled water with which the bottles B and C are about three fourths filled, the gas bubbling up as usual from glass tubes leading to the bottom of each bottle, and the excess, not absorbed by the water, passing forward to the large bottle C, which serves as a gasometer. All these bottles are fitted as tightly as possible with rubber stoppers, through which pass the stout glass tubes that conduct the gas. Through the stopper of D pass three such tubes: the first which brings the unabsorbed gas from C opens at the top of the bottle; the second is connected by a rubber hose with a water faucet, and reaches to the bottom of the bottle; the third serves simply as a vent. The bottles B and C are fitted each with two tubes, one to deliver the gas at the bottom of the bottle, and the second, opening from the top, to conduct away the excess. The gas generator A requires only an exit tube, and lastly the wash bottle is fitted in the ordinary way, save only that we pack it with well-washed sponge, by which the gas is more effectually purified than when it bubbles through a liquid. We use glass tubes of about $\frac{3}{16}$ inch bore, and rubber hose of the same calibre, but very stout, and made of pure vulcanized rubber. The rubber stoppers are cut from what we call *stopper cord*, which, as well as the hose, is made by the Boston Belting Company, corner Chauncy and Bedford Streets, Boston. In mounting the apparatus, we interpose two or three feet of hose between the several parts, so as to have sufficient freedom of motion to enable us to shake up the water with the gas in the bottles B and C. Over the ends of the tubes from each of the bottles B and C we stretch permanently two rubber connectors, cut from the hose just described, and depend wholly on *pressure taps*, acting on these connectors, for closing the bottles. While charging the water with gas the connectors are united to the hose by short lengths of glass tube, and subsequently the solution is drawn off through a bent glass tube slipped into one of the same connectors. The bottles, thus arranged, serve the same purpose as a soda-water siphon. The rubber stoppers soon become cemented to the glass, and are never removed, the bottles being filled, as they are vented, through the glass tubes. A rubber connector with a pressure tap must also be provided for the vent tube of the large bottle C, which serves, as we have said, to receive the unabsorbed gas. In charging the water, we leave the vent of this gasometer open until the air is expelled from the apparatus, and then connect the vent tube by a rubber hose with a manometer, which, if a common steam manometer is not at hand, can be easily extemporized with a glass tube and a little mercury. We now watch the pressure, and when it becomes equal to the water pressure on our faucet, we turn on the water head. On first opening the faucet, it is necessary to watch the process very closely, lest the water should be forced back into the generator, but the apparatus soon adjusts itself to the new conditions, and the absorption goes on as regularly as before. The unabsorbed gas is of course stored in the bottle C, and gradually pushes back the water, with which at first it is three fourths filled, into the supply pipe; but only a small portion of the gas is lost, and with the apparatus of the dimensions described, a two-gallon bottle is large enough to hold all the excess which escapes before the water is saturated. To insure perfect saturation, the water in each of the bottles B and C should be frequently shaken up with the gas, especially towards the end of the process.

We constantly use an apparatus mounted as above, with a water-head of about thirty feet. It would undoubtedly stand a much greater pressure, but a solution saturated under a pressure of two atmospheres is as strong as is desirable. For example, one hundred cubic centimetres of such a solution is more than sufficient to precipitate a gramme of antimony. For saturating four litres of water in an apparatus of the dimensions described above, the charge should be about 200 grammes of ferrous sulphide, about two litres of water, and 288 grammes, or 160 cubic centimetres, of sulphuric acid. As this amount of acid water, when at a low temperature, is insufficient to dissolve all the ferrous sulphate formed, we place the generator in front of a hot-air register. In dismounting the apparatus, we close first the inlet tube of the bottle B, and then remove the generator and wash bottle; but care must be taken to relieve the pressure on the generator very slowly. Otherwise the escaping gas will cause the acid solution of ferrous sulphate, left in the bottle, to boil over.

By the use of a solution of hydric sulphide in place of the gas, the consumption of ferrous sulphide in our large laboratory has been reduced twenty-fold; and when it is remembered that by the previous waste the air of the room was constantly poisoned, and the waste-pipes clogged with the undissolved sulphide of iron, carelessly washed into the sinks, the advantage will be appreciated. The gain in those processes of quantitative analysis where hydric sulphide is required is hardly less important. The bubbling of a gas through a liquid inevitably entails loss, which can be wholly avoided by using the solution; and, by regulating the pressure on the tap, the reagent can be delivered in the proportions required, and at the exact point where it is wanted. Complete precipitation, moreover, is effected in a few minutes; and, if the liquid is constantly stirred as the reagent slowly flows in, the precipitate will settle in a condition admirably adapted for filtering. Lastly, the separation of sulphur, which is often so excessive when the gas is employed, is diminished, if not prevented, by using the reagent in solution.